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Center 3683, Examiner  
Christopher P. Schwartz  
FIRM: USPTO  
FAX NO.: (571) 273-8300From: Kevin G. Micrzwia  
Date: August 12, 2005  
Our File No.: 81095828 (PGT 1910 PA)  
Your Ref. No.: 10/708,677  
Comments: Attached is Appeal Brief pursuant to Notice of Appeal  
dated 6/13/05.Total Pages (incl. Cover sheet): 11

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

PATENT

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AUG 12 2005

In re Application of:

Timothy G. Offerte

Group Art Unit: 3683

Serial Number: 10/708,677

Examiner: Schwartz, Christopher P.

Filed: 03/18/2004

For: METHOD AND APPARATUS FOR PREDICTING THE POSITION OF  
A TRAILER RELATIVE TO A VEHICLE

Attorney Docket No: 81095828 (FGT 1910 PA)

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BRIEF ON APPEAL

Mail Stop Appeal Brief - Patents  
Commissioner for Patents  
Box 1450  
Alexandria, VA 22313-1450

Sir:

The following Appeal Brief is submitted pursuant to the Notice of Appeal dated June 13, 2005.

1  
(10/708,677)

**I. Real Party in Interest**

The real party in interest in this matter is Ford Global Technologies, LLC, which is a wholly owned subsidiary of Ford Motor Company both in Dearborn, Michigan (hereinafter "Ford").

**II. Related Appeals and Interferences**

There are no other known appeals or interferences which will directly affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

**III. Status of the Claims**

Claims 1-30 stand rejected in the Final Office Action. A copy of the claims on appeal is attached as an Appendix.

**IV. Status of Amendments**

There have been no amendments filed subsequent to the final rejection.

**V. Summary of the Claimed Subject Matter**

Claims 1, 12 and 21 are independent claims. Each of these independent claims has a common theme. Referring specifically to Claim 1, a method is set forth in which a sensor sensing a current position of the trailer relative to the vehicle is provided as the first step. Determining a steering wheel angle and determining a predicted position of the trailer based upon the current position and the steering wheel angle is set forth. Also, displaying within the vehicle the current position and the predicted position of the trailer relative to the vehicle is set forth. Claims 19 and 20 as well as paragraphs 120 and 121 (of the second substitute specification) set forth the description of the invention. It should be noted that Fig. 20 illustrates one example of a display. The initial position is illustrated with future positions  $x_1$ ,  $x_2$  and  $x_3$ . As recited in Claim 1, only one future or predicted position is illustrated. It should also be noted that a predicted position is a position other than the current position. That is, it is a predicted future position.

Claim 12 is similar to Claim 1 in many respects except the additional steps of generating a reverse direction signal corresponding to a reverse direction of the vehicle. Thus, Claim 12 is specifically directed to predicting the display during a reverse direction of the vehicle.

Claim 21 is a system claim similar to that set forth in Claim 12. The position sensor such as hitch sensor 174 is illustrated in Figure 4. The means to generate a reverse

signal may comprise many means including the transmission 148 or the wheel speed sensors 130, 132 of Figure 4. A steering wheel angle sensor is set forth as element 38 of Figure 3. The controller is illustrated as element 26 of Figure 3. The display is illustrated as reference numeral 68 in Figure 20. The dependent claims stand or fall together with their independent claims.

#### VI. Grounds of Rejection to be Reviewed on Appeal

The following issues are presented in this appeal:

Whether Claims 1-4, 11-27, 29, and 30 are unpatentable under 35 U.S.C. §103(a) over *Deng* (6,292,094) or *Gerum* (5,747,689) in view of *Mizusawa* (US2002/0145663).

Whether Claims 5-10 and 18 are unpatentable under 35 U.S.C. §103(a) over *Gerum* or *Deng* in view of *Mizusawa* and in further view of *Hrazdera* (6,704,637).

Whether Claim 28 is unpatentable under 35 U.S.C. §103(a) over *Deng* or *Gerum* in further view of *Yoshioka* (5,481,357).

#### VII. Argument

##### The Rejection of Claims 1-4, 11-27, 29, and 30

##### Claim 1

Both the *Deng* reference and the *Gerum* reference are believed to provide only a current position of the vehicle and trailer. The Examiner points to Cols. 2 and 3 of the *Deng* reference for a trailer system that senses a current position (or hitch angle) of a trailer relative to a vehicle and determines and uses a steering wheel angle to determine a predicted position of the trailer position based on the current position thereof and the steering wheel angle. From Cols. 2 and 3 it is clear that the *Deng* reference looks at a maximum permissible hitch angle. This is set forth in Col. 2, lines 42-63. This passage describes the hitch angle reported to the controller by the respective sensors. The controller system then performs calculations to determine whether the current hitch angle exceeds a maximum permissible hitch angle that can be overcome while continuing to back up utilizing the full capability of the front and rear steering. Based upon a hitch angle threshold, the vehicle is controlled. Appellants respectfully submit that only a threshold is described and not a current position and a future position based upon a current position and the steering wheel angle.

The *Gerum* reference sets forth a drive stability enhancement of multi-unit vehicles. The Examiner points to Claims 1-7 of the *Gerum* reference for determining a predicted position of the trailer based upon the current position and the steering wheel angle. Appellants respectfully believe that the *Gerum* reference also only sets forth a current position based upon modeling as set forth in the claims. The model uses the hitch angle, the hitch angle rate, and measured signals from sensors on the towing vehicle. Based upon the model, a control scheme may be implemented. As claim 5 recites, possible jackknifing of the combined vehicle may be detected. Appellants can find no teaching or suggestion that a predicted or future position of the trailer based upon the current position and the steering wheel angle is set forth.

The *Mizusawa* reference is set forth for teaching a camera and a display. Claim 1 of the present application recites displaying within the vehicle the current position and predicted position of the trailer relative to the vehicle. Thus, both the current and predicted positions are set forth on the display. The *Mizusawa* reference describes a system for hitch location and not a future and current position of a trailer. Appellants can find no teaching or suggestion in the reference for a predicted position. Appellants therefore respectfully request the Examiner to reconsider the reference since a predicted position is not taught or suggested in either of the three references. It would also not be evident to those skilled in the art that a modification of either of the three references would produce a predicted position. Each of the references are set forth in determining a present position of the vehicle.

#### **Claims 2-4 and 11**

Claims 2-4 and 11 are further limitations of Claim 1 and should also be allowable for the same reasons set forth above.

#### **Claim 12**

Claim 12 is similar to Claim 1 in that a predicted position of the trailer based upon the current position and steering wheel angle is set forth. Claim 12 is believed to be allowable for the same reasons set forth above.

**Claims 13-20**

Claims 13-20 are further limitations of Claim 12 and are believed to be allowable for the same reasons set forth above.

**Claim 21**

Claim 21 is a system for a vehicle coupled to a trailer that includes a position sensor, a display and a controller coupled to the trailer position signal display. A controller displays a predicted path of the trailer in response to the position signal. As mentioned above, no predicted path is taught or suggested in either of the three references. Appellants therefore respectfully request the Board to reconsider the rejection of Claim 21.

**Claims 22-27, 29 and 30**

Claims 22-27, 29, and 30 are further limitations on Claim 1 and are believed to be allowable for the same reasons set forth above.

**The Rejection of Claims 5-10 and 18****Claims 5-10 and 18**

The *Gerum*, *Deng* and *Mizusawa* references fail to teach or suggest the predicting positions. Claims 5-10 and 18 are further limitations of their independent claims. Appellants have reviewed Col. 4 of the *Hrazdera* reference and can find no teaching or suggestion for a predicted path. The *Hrazdera* reference is set forth for teaching brake steering. However, this reference also does not teach or suggest the use of brake steering and predicting a path for a trailer. Appellants therefore respectfully request the Board to reverse the Examiner's position for this rejection as well.

**The Rejection of Claim 28****Claim 28**

The *Yoshioka* reference also does not teach or suggest detecting a predicted path. Appellants therefore respectfully request the Examiner for reconsideration of this rejection as well.

**VIII. Claims Appendix**

A copy of each of the claims involved in this appeal, namely claims 1-35 is attached hereto as Appendix.

**IX. Evidence Appendix**

None.

**X. Related Proceedings**

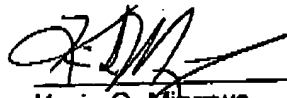
None.

**XI. Conclusion**

For the foregoing reasons, Appellant respectfully requests that the Board direct the Examiner in charge of this examination to withdraw the rejections.

Please charge any fees required in the filing of this appeal to deposit account 06-1510 or, if there are insufficient funds, to use deposit account 06-1505.

Respectfully submitted,

  
\_\_\_\_\_  
Kevin G. Mierzwa  
Registration No. 38,049  
Attorney for Appellant

Date: 8/12/05

Artz & Artz, P.C.  
28333 Telegraph Road, Suite 250  
Southfield, Michigan 48034  
(248) 223-9500

**APPENDIX**

1. A method for use in a vehicle comprising:  
sensing a current position of a trailer relative to the vehicle;  
determining a vehicle steering wheel angle;  
determining a predicted position of the trailer based on the current position and the steering wheel angle; and  
displaying within the vehicle the current position and the predicted position of the trailer relative to the vehicle.
2. A method as recited in claim 1 wherein sensing a current position comprises sensing the current position in response to a camera.
3. A method as recited in claim 1 wherein sensing a current position comprises sensing the current position in response to a reverse aid system.
4. A method as recited in claim 1 wherein sensing a current position comprises sensing the current position in response to a hitch sensor.
5. A method as recited in claim 1 further comprising applying brake-steer to the trailer to reduce the turning radius of the trailer and vehicle.
6. A method as recited in claim 1 further comprising applying brake-steer to the trailer and vehicle to reduce the turning radius of the trailer and vehicle.
7. A method as recited in claim 1 further comprising applying brake-steer to the vehicle to reduce the turning radius of the trailer and vehicle.
8. A method as recited in claim 7 wherein applying brake-steer comprises applying at least one brake at a first wheel to reduce a vehicle turning radius.
9. A method as recited in claim 7 wherein applying brake-steer comprises applying an increased drive torque to a second wheel relative to a first wheel.



10. A method as recited in claim 7 applying brake-steer comprises increasing a normal load on the vehicle.

11. A method as recited in claim 1 wherein determining a predicted position comprises determining a vehicle trailer interference and displaying the interference.

12. A method of controlling a vehicle having a trailer comprising:  
generating a reverse direction signal corresponding to a reverse direction of the vehicle;

sensing a current position of a trailer relative to the vehicle;

determining a vehicle steering wheel angle;

determining a predicted position of the trailer based on the current position of the trailer and the steering wheel angle; and

displaying the current position and the predicted position within the vehicle in response to the reverse direction.

13. A method as recited in claim 12 wherein sensing a current position comprises sensing a current position in response to a camera.

14. A method as recited in claim 12 wherein sensing a current position comprises sensing a current position in response to a reverse aid system.

15. A method as recited in claim 12 wherein sensing a current position comprises sensing a current position in response to a hitch sensor.

16. A method as recited in claim 12 wherein generating a reverse direction signal comprises generating a reverse direction from a shift lever.

17. A method as recited in claim 12 wherein generating a reverse direction signal comprises generating a reverse direction from a push button.

18. A method as recited in claim 12 wherein generating a reverse direction signal comprises generating a reverse direction from a transmission controller.

19. A method as recited in claim 12 wherein generating a reverse direction signal comprises generating a reverse direction from a wheel speed sensor.

20. A method as recited in claim 12 wherein generating a vehicle steering angle comprises generating a steering angle in response to a steering angle sensor.

21. A system for a vehicle coupled to a trailer comprising:  
a position sensor generating a trailer position signal corresponding to a trailer position;

means to generate a reverse direction signal corresponding to a reverse direction of the vehicle;

a display;

a steering wheel angle sensor; and

a controller coupled to the trailer position signal display, and steering wheel angle sensor, said controller displaying a predicted path of the trailer in response to the position signal.

22. A system as recited in claim 21 wherein means to generate a reverse direction signal comprises a shift lever.

23. A system as recited in claim 21 wherein means to generate a reverse direction signal comprises a push button.

24. A system as recited in claim 21 wherein means to generate a reverse direction signal comprises a transmission controller.

25. A system as recited in claim 21 wherein means to generate a reverse direction signal comprises a wheel speed sensor.

26. A system as recited in claim 21 wherein the position sensor comprises a hitch sensor.

27. A system as recited in claim 21 wherein the position sensor comprises a reverse aid sensor.

28. A system as recited in claim 21 wherein the reverse aid sensor comprises an ultrasonic sensor.

29. A system as recited in claim 21 wherein the position sensor comprises a camera.

30. A system as recited in claim 21 further comprising an input device coupled to said controller.